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Isolated Condyle Fracture Of Mandible Our Experience

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ABSTRACT

Aim-To determine the result for conservative management for isolated condyle fracture mandible

BACKGROUND & RATIONALE:

Mandible condyle fracture accounts for about 30% of all mandible fractures. At present there are no clear defined guidelines for the treatment of mandibular condyle fracture. treatment includes surgical fixation of condyle or conservative management with closed reduction. Surgical treatment runs the risk for facial nerve injury and bone resorption due to capsular injury. here we study the results of conservative treatment for condyle fractures with intermaxillary fixation with wire or elastics.

RESEARCH QUESTION:

Does conservative approach for mandible condyle fracture gives good result

OBJECTIVE:

1) To determine the prevalence of mandible condyle fractures.
2) To describe the demographic characteristics of the study population.
3) To describe the conservative approach for condyle fractures of mandible.
4) To determine the results for conservative approach for condyle fracture mandible.

Result

Conservative management of condyle fracture with intermaxillary fixation gives a good results for the patient.

I. INTRODUCTION

Mandible condyle fracture accounts for about 30% of all mandible fractures.At present there are no clear defined guidelines for the treatment of mandibular condyle fracture. Treatment includes surgical fixation of condyle or conservative management with or without closed reduction.Surgical treatment runs the risk for facial nerve injury and bone resorption due to capsular injury. Here we study the results of condyle fractures with consrvative management with or without intermaxillary fixation with wire or elastics.

II. REVIEW OF LITERATURE

ANATOMY AND PHYSIOLOGY OF MANDIBLE The mandible The mandible, which is the hardest monostotic bone among facial bones, is a U-shaped long bone (Fig. 1). It consists of areas with and without teeth, and binds to the bilateral temporal bones at the left and right TMJ. At the early stage of development, it develops laterally and fuses at the midline 1 to 2 years after birth, forming a complete structure like the maxilla. Name of each area has some variation depending on the literatures. However, the most clinically useful classification of each area divides the mandible into the symphysis and parasymphysis, body, angle and ramus, condylar process, coronoid process, and alveolar process. The symphysis and parasymphysis refers to an area between both canine. The body refers to an area from the canine to the second molar. The angle and ramus refers to the area next to third molar except for the coronoid and condylar process. The mandibular condyle consists of the condylar process and head of the mandible. The condylar process and head subunit refers to a superior area of the extension line connecting the masseteric tuberosity from the deepest area of the sigmoid notch. The condylar process and head subunit consists of the head, neck, and subcondylar area. These are three height level lines that divide the subunit, and define the boundary. The three height level lines consist of an extension line that is parallel to the posterior border of the mandible, an extension line that parallelly heads for the perpendicular from the deepest area of the sigmoid notch, and an extension line that is inferior to the condylar head lateral pole. The condylar head refers to an area that is superior to the extension line that is inferior to the condylar head lateral pole. The condylar neck refers to an area between the extension line that is inferior to the condylar head lateral pole and the extension line that parallelly heads for the perpendicular from the deepest area of the sigmoid notch. The subcondylar area refers to an area that is inferior to the extension line that parallelly heads for the

perpendicular from the deepest area of the sigmoid notch. Meanwhile, the condylar neck is divided into the high level and low level, and the reference line dividing them is an extension line that is positioned in the middle of the sigmoid notch line and the lateral pole line of the head.

The elevated area of the midline of the mandible is defined as mental protuberance. The mental tubercle exists inferior to the left and right elevated areas and the mental foramen by which important facial nerves and blood vessels pass exists laterally superior to the aforementioned nodule area. Internally, a pair of the mental spines exists inferiorly to the midline, from which the genio-glossus and stylohyoid muscle originate. The mylohyoid line that reaches the mandibular ramus postero–superiorly exists at the lateral side of the mental spine. The mylohyoid muscle originates from the mylohyoid line. The nerve root is positioned below the mylohyoid muscle, and controls it. The mandibular angle and ramus is a rectangular bony part that exists superoposteriorly to the mandibular body. Mandibular angle size varies depending on age and individuals. It is approximately 140° in children and 110° to 120° in adults. The tuberositasmasseterica and tuberositaspterygoidea exist at the lateral side and internal side of mandibular angle, respectively. They are insertion parts of the masseter muscle and medial pterygoid muscle, respectively.

Temporo-mandibular joint The mandibular condyle forms articulation with the mandibular fossa of the temporal bone, which is called temporo mandibular joint. The articulation disc, which is a fibrous tissue, existsbetween the TMJ, and acts as a buffer. As synovial fluid that has lubrication function inside the joint capsule exists around the joint. It minimizes friction during joint motion, and enables the smooth movement of the joint. The articulation disc generally has an oval shape. However, as its shape is determined by the shape of the condyle head and mandibular fossa, its size and shape may vary. The articulation disc is composed of fibrous tissues without nerve or blood vessel, and disc thickness is 1 mm for the center, 3 mm for the posterior aspect, and 2 mm for the anterior aspect. Thus, it has a shape that is the thinnest in the center and the thickest in the posterior aspect. For the normal joint, the mandibular condyle is positioned at the center which is the thinnest. Thus, disc injury occurs at the center due to aging or chronic physical stimuli. The disc is attached to the condyle head via the bilateral articular disc ligaments, which prevents the deviation of the disc from the condyle head during mandibular movement. The joint capsule that surrounds the TMJ produces the synovial fluid internally, and the produced synovial fluid acts as a lubricant during mandibular movement, and supplies nutrients to an area without blood vessels. In addition, as the joint capsule has substantial wrinkles, it changes the contact area during mandibular movement, protecting the joint. The temporo mandibular ligament with a triangular shape exists at the lateral side of the articular capsule, and it prevents excessive movement that is beyond the normal range of the mandible during madibular movement. The temporo mandibular ligament is rigidly fixed by the temporal bone and mandible, which provides the stability of TMJ movement. Unlike hinge-typed joints of the four extremities, the TMJ has characteristics of the simultaneous movement of the bilateral joints during mandibular movement such as talking or eating. The left and right TMJ can not move independently, and is closely associated with dental occlusion.

Occlusion and mandibular movement Occlusion Occlusion is intercuspation between the teeth. It is divided into static occlusion without jaw movement and functional or dynamic occlusion with jaw movement. Static occlusion may vary depending on condyle location, among which maximum intercuspaloccclusion or intercuspal occlusion position refers to a site that contact the teeth most frequently. This is known as centric occlusion (CO). CO is a relationship between the teeth regardless of condyle position. As CO may be changed by prosthodontic treatment or jaw surgery, condyle location that is always constant and reproducible is required. This is because the condyle location that acts as a reference for prosthodontic treatment or jaw surgery is required. Procedures where the stability of condyle position is not maintained eventually cause TMJ disease or malocclusion. Based on the aforementioned concept, occlusion at condyle position that is stable and reproducible without intercupation is defined as centric relation (CR), and called centric relation occlusion (CRO). If CRO is same as CO, it is considered as ideal occlusion. Condyle position in CR has been controversial over a long period of time. Currently, most anterior-superior position reported by Celenza and Nasedkin [3] is considered the closest position.

This static occlusion occurs for a short time in a daily living. In most cases, functional occlusion with jaw movement occurs. During jaw movement anterior movement, occlusal contact occurs at the anterior teeth and disclusion occurs at the remaining teeth. During lateral movement, occlusion occurs at the working sided canine or

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canine premolar group teeth, and disclusion occurs at the remaining teeth. This is called guidance.

The anterior region is far away from force point so that it is tolerable to lateral force during anterior movement. Meanwhile, the canine has a long root and the alveolar bone is hard so that it is tolerable to lateral force during lateral movement. If teeth other than the guidance teeth contact during the aforementioned movement, they are relatively more vulnerable to lateral force. It causes periodontal ligament injury, which is vulnerable to periodontitis. Eventually, teeth supporting becomes weak due to absorption by the adjacent alveolar bone. The teeth become exfoliated. This status refers to trauma from occlusion (TFO).

Mandibular movement Mandibular movement occurs by the involvement of the TMJ as a posterior guidance, and teeth as an anterior guidance. The TMJ as a ginglymoarthroidal joint has a movement of 25 to 30 mm by the upper joint space. The mouth opening as a hinge joint has rotation movement. Beyond that, the mouth opening as sliding joint has a movement in addition to rotation movement (Fig. 5). In addition, the bodily lateral movement of the mandible occurs during lateral excursions, which refers to bennett movement (Fig. 6). If no bennett movement occur due to interference caused by changes in condyle position during fracture or jaw surgery though occlusion is normal, mandibular movement disorder occurs. If the disorder is persistent for a long time, TMJ diseaseocclusion instability relapse may be caused.

OBJECTIVE

- To describe the demographic characteristics of the study population.
- To describe the conservative approach for condyle fractures of mandible.
- To determine the results for conservative approach for condyle fracture mandible.

Methodology :

Study design -- cross sectional study

Source of study – Department of plastic and reconstructive surgery, Tirunelveli Medical college

Duration of study – 2 years

Sample size – 20 patients. Calculated with formula 4PQ/D^2

Inclusion criteria

All the patients with condyle fractures from 2021 to 2023

Patients whose clinical findings and radiological diagnosis were clearly outlined Data entry will be done using Microsoft Excel. Statistical analysis will be done using SPSS version 23.

Frequencies and proportions will be calculated as appropriate.

Means, Range and standard deviation will be calculated for quantitative variables.

The difference between the proportions will be calculated using the Chi-Square test

Inclusion criteria

- All the patients with condyle fractures from 2021 to 2023
- Patients whose clinical findings and radiological diagnosis were clearly outlined

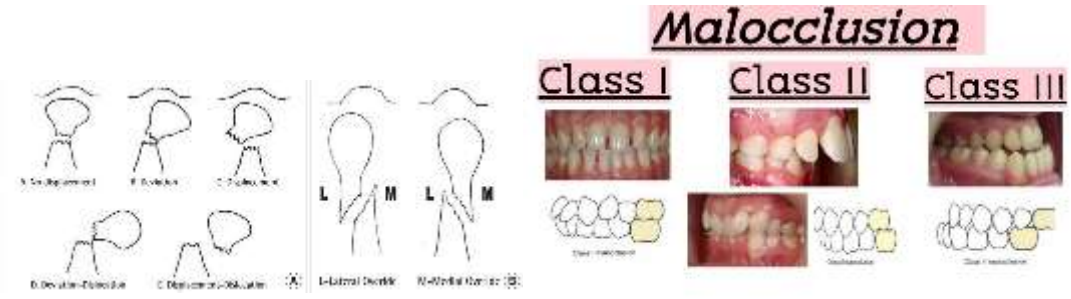
Exclusion criteria

- Patients with incomplete clinical records
- Non compliant patients
- Patients with associated other mandible fractures

Study design

Patients who presented with faciomaxillary trauma were assessed and patients with isolated condyle fracture of mandible were selected for the study. Their demographic characteristics were collected and evaluated. All patients were diagnosed with computer tomography of facial bone with 3D reconstruction. Patients were then assessed for the type of condyle fractures based on MacLenan classification. Patients were then assigned treatment according to the degree of mouth opening and malocclusion.

MacLenan classification of condyle fractures mandible



Patients were followed up for 6 weeks.And assessed for mouth opening and occlusion

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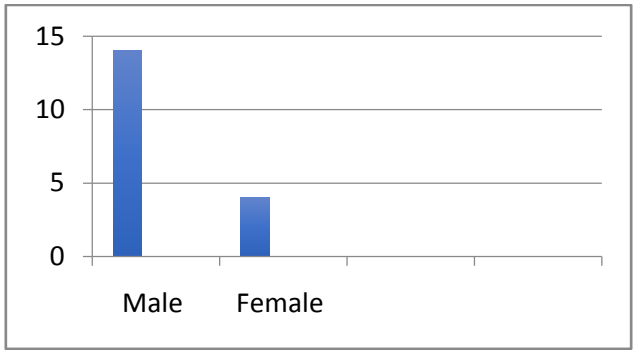
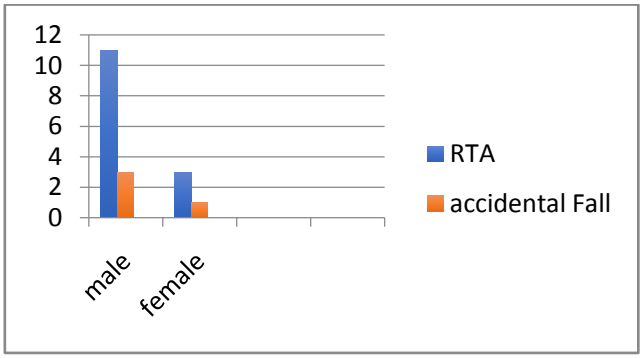
III. RESULTS

Total number of isolated condyle fractures of mandible - 18. Male : Female 3.5 : 1 (14 males and 4 females)Road traffic accidents involving two wheeler was the most common cause (14) followed by accidental fall (4)

Sex distribution

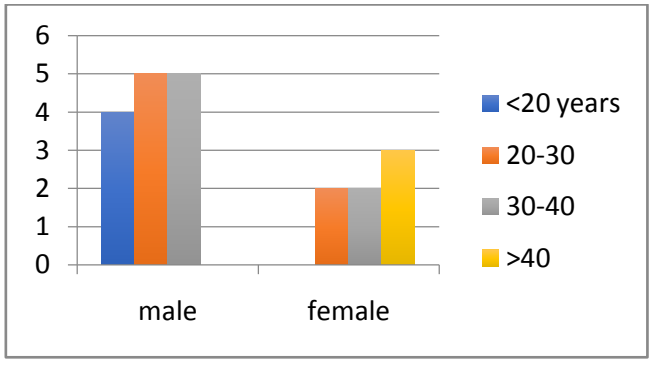


Mode of injury



- Most common age group include 20 to 40 years among both sexes (14)
  - Followed by < 20 years (males)
  - > 40 years (females)

Age



MacLenan classification

	male	female
Class I	5	1
Class II	5	1
Class III	1	2
Class IV	3	

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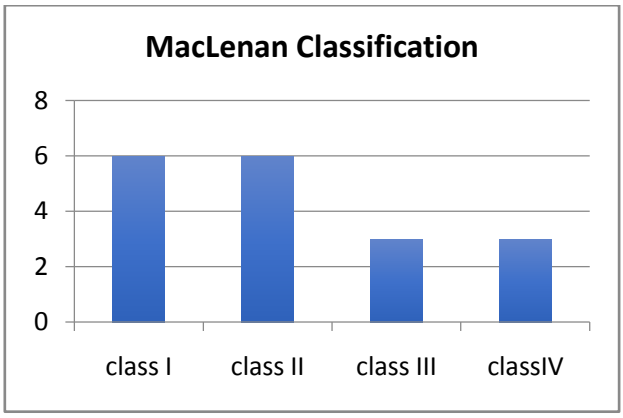
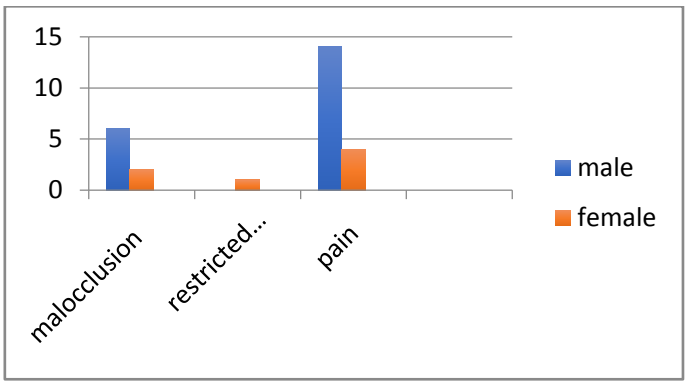
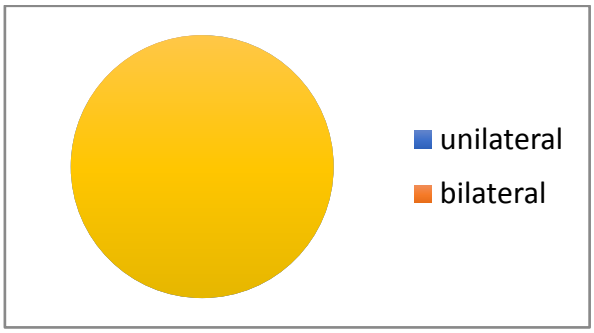


- The most common symptoms was pain (18)
- Malocclusion was seen in 8 patients
  (6 male and 2 female)
- Restricted mouth opening seen in 1 patient
  (20mm)
- Patients with class III and class IV had malocclusion

Symptoms



3 patients had bilateral fractures



- Patients with malocclusion underwent closed reduction with intermaxillary fixation with steel wire or zero elastic bands
  - 6 male
  - 2 female
  - Rest of the patients were conservatively managed with regular follow up

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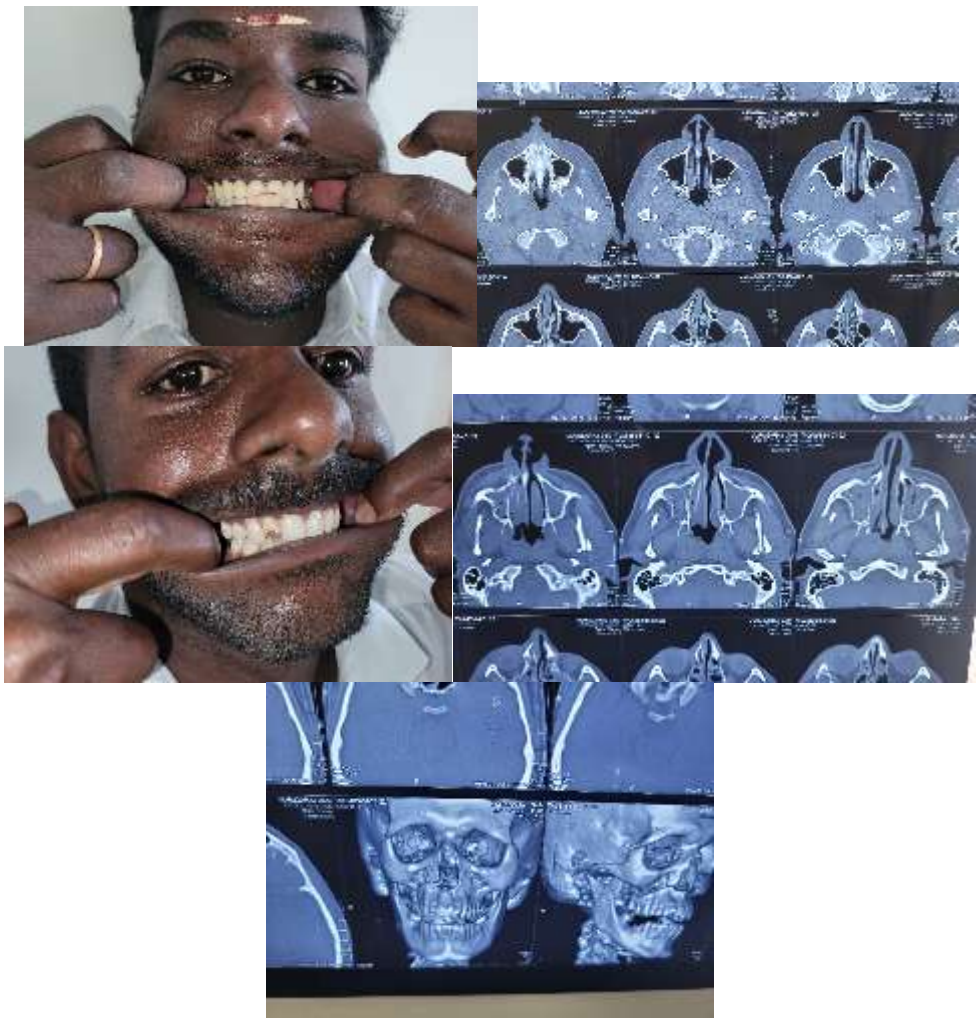
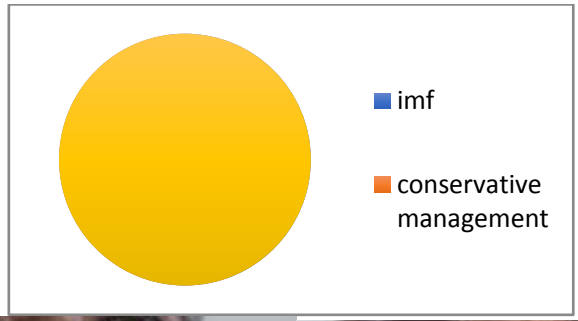


Treatment



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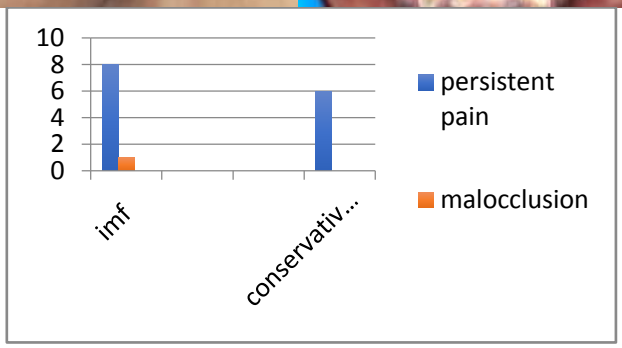
- All patients treated wit IMF had good occlusion and on followup had mouth opening of > 40 mm
  - 1 patient had persistent malocclusion
- Persistent Pain was the most common complication which was seen in majority (14) of the patients on follow up after 6 weeks



IV. DISCUSSION

- Isolated condyle fractures are rare
- Condyle fracture are usually associated with other mandible fractures
  - Force of impact not directly absorbed by location of impact
  - The most common etiology was road traffic accidents involving two wheeler
- Males 20 years to 40 years were commonly affected
- Most common symptom was pain which persisted in majority of our patients
- Malocclusion was observed in Class III and Class IV fractures

- Patients with malocclusion treated with closed reduction and IMF had good occlusion postoperatively
- Current trend is shifting for surgical intervention (class IV) laterally displaced fractures

V. CONCLUSION

- A uniform treatment protocol is lacking for condyle fractures of mandible
- Surgical approach requires experience and may be associated with complications
- Conservative approach or closed reduction with intermaxillary fixation can reduce the malocclusion giving a acceptable result for the patient

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